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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/570,594	10/31/2006	Chikako Takatoh	TAKATOHI	2977
1444 7590 09/26/2007 BROWDY AND NEIMARK, P.L.L.C. 624 NINTH STREET, NW SUITE 300 WASHINGTON, DC 20001-5303			EXAMINER PANDE, SUCHIRA	
			ART UNIT	PAPER NUMBER
			1637	
			MAIL DATE	DELIVERY MODE
			09/26/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/570,594

**Applicant(s)**

TAKATOH ET AL.

**Examiner**

Suchira Pande

**Art Unit**

1637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 4-8 is/are pending in the application.
- 4a) Of the above claim(s) 8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>02/12/07; 03/06/07</u> .                                      | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claim 8 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group II invention (apparatus), there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on August 30 2007.
2. Elected invention group I claims 4-7 drawn to a method are currently pending and will be examined in this action.

### ***Priority***

3. Applicant has submitted certified copy of Japanese 2003-314662 application filed on September 5, 2003 however no English translation is provided, hence for prior art purposes the filing date of PCT application September 6, 2004 is considered as the priority date of the instant application.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 4 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Larsson et al. (1994) J. Am. Chem. Soc. 116:8459-8465.

Regarding claim 4, Larsson et al. teach : A method for detecting a hybrid nucleic acid (see line 1 abstract where double stranded DNA is taught. The

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teaching of double stranded DNA is being interpreted broadly to teach a hybrid nucleic acid—which by definition is double stranded) by use of a cationic dye compound (YOYO), comprising:

providing a cationic dye compound comprising a cation group and a chromophore coupled to said cation group, said chromophore having a heteropolycyclic structure containing a nitrogen atom (see fig. 1);

bringing a nucleic acid probe (see page 8459 par. 3 where YOYO is taught as a suitable probe for double stranded DNA—thus teaching bringing a nucleic acid probe) and a sample containing a target nucleic acid (double stranded DNA is taught as the target nucleic acid) into contact with each other under hybridization conditions to form a hybrid nucleic acid composed of said nucleic acid probe and said target nucleic acid (see page 8460 par. 3 where mixing of YOYO dye and DNA is taught to form the hybrid nucleic acid composed of said nucleic acid probe and said target nucleic acid);

binding said cationic dye compound onto said hybrid nucleic acid by adding the cationic dye compound before, during or after said hybridization(see abstract); and

measuring circular dichroism of said cationic dye compound bound onto said hybrid nucleic acid (see abstract where measurement of circular dichroism (CD) of said cationic dye compound bound onto said hybrid nucleic acid is taught) .

Regarding claim 7, Larsson et al. teach: The method further comprising:

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immobilizing an analyte having said target nucleic acid or said nucleic acid probe onto a solid phase carrier to bring said analyte and said nucleic acid probe into contact with each other under hybridization conditions (see page 8459 par 3 where electrophoretic behavior of ds DNA in gels of fluorescently stained DNA is taught. . By teaching gel (as solid phase) electrophoresis of DNA Larsson et al. teach immobilizing an analyte having said target nucleic acid or said nucleic acid probe onto a solid phase carrier to bring said analyte and said nucleic acid probe (YOYO---probe is bound to ds hybrid DNA thereby inherently meeting the requirements that they were put into contact with each other under hybridization conditions.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a

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later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 5 and 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Larsson et al. (1994) J. Am. Chem. Soc. 116:8459-8465 further in view of Juarrenz et al. (April 1996) J. of microscopy vol. 182, Pt. 1, pp. 46-49 (provided by Applicant in IDS).

Regarding claim 5, Larsson et al. teach method of claim 4 but do not teach wherein said cationic dye compound is represented by the following general formula (I):  $X-(Y-Z)_n$

where n denotes 1 to 12,

X represents a chromophore having at least four pyrrole rings,

Y represents a connecting group or a direct bond between X and Z, and

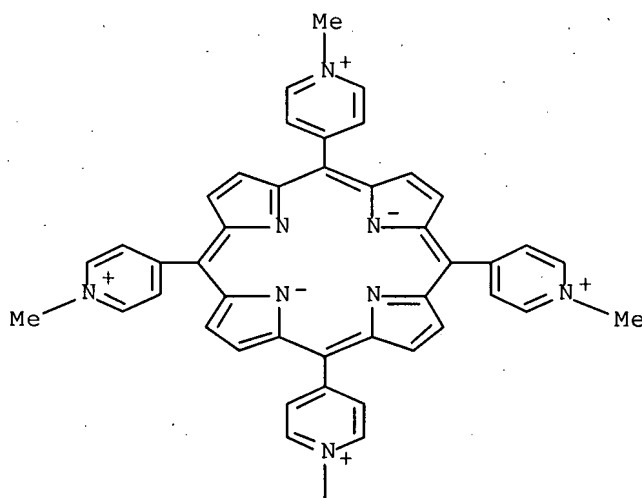
Z represents a cationic functional group, or a functional group whose property is convertible to a cationic property.

Regarding claims 5 and 6, Juarrenz et al. teach meso-tetra (4-N-methylpyridyl)porphine (T4MpyP) and meso-tetra (p-N-trimethylanilinium) porphine (TMAP) (see abstract) as a cationic dye compound is represented by the following general formula (I):  $X-(Y-Z)_n$ . A search done in STN for these chemicals provides following structure.

L14 3 ANSWERS REGISTRY COPYRIGHT 2007 ACS on STN  
IN Pyridinium, 4,4',4'',4'''-(21H,23H-porphine-5,10,15,20-  
tetrayl)tetrakis[1-  
methyl-, bis(inner salt). (9CI)  
MF C44 H36 N8

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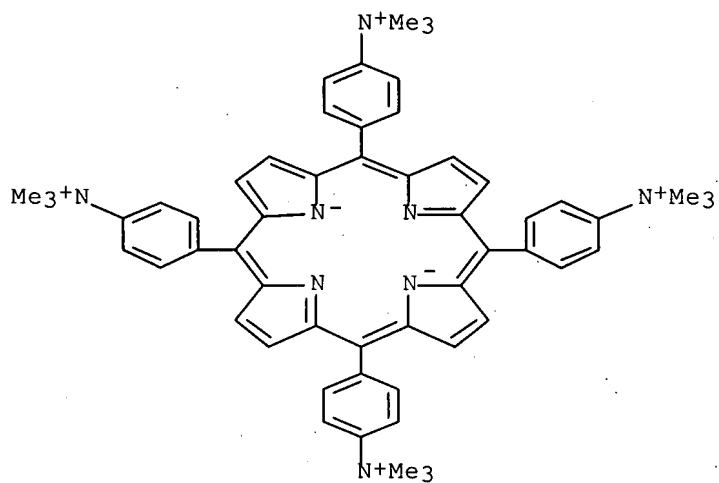
PAGE 1-A



PAGE 2-A

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L14 3 ANSWERS REGISTRY COPYRIGHT 2007 ACS on STN  
IN Benzenaminium, 4,4',4'',4'''-(21H,23H-porphine-5,10,15,20-  
tetrayl)tetrakis[N,N,N-trimethyl-, bis(inner salt) (9CI)  
MF C56 H60 N8



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Thus regarding claim 5, Juarrenz et al. teach wherein said cationic dye compound is represented by the following general formula (I):  $X-(Y-Z)_n$

Thus regarding claim 6, Juarrenz et al. teach wherein said chromophore is selected from the group consisting of porphyrin, porphyrin derivatives.

It would have been prima facie obvious to one of ordinary skill in the art to practice the method of Juarrenz et al. in the method of Larsson et al. at the time the invention was made. Both YOYO taught by Larsson et al. and porphyrin, porphyrin derivatives taught by Juarrenz et al. are dyes that bind to DNA and are used for measuring CD. Thus one of ordinary skill can readily use one or the other dye for the same purpose. See MPEP 2144.06 Art Recognized Equivalence for the Same Purpose –

#### **SUBSTITUTING EQUIVALENTS KNOWN FOR THE SAME PURPOSE**

In order to rely on equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on applicant's disclosure or the mere fact that the components at issue are functional or mechanical equivalents. An express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982).



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**Conclusion**

9. All claims under consideration 4-7 are rejected over prior art.
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suchira Pande whose telephone number is 571-272-9052. The examiner can normally be reached on 8:30 am -5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571-272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Suchira Pande  
Examiner  
Art Unit 1637

  
JEFFREY FREDMAN  
PRIMARY EXAMINER

9/11/02